

TUBE Tasting

A Player's Guide: Pt3 EL84 & 6V6GT

TAKE A LOOK BEHIND THE WORLD'S FAVOURITE recording amps like Fender Champs and Deluxes, Vox AC15s and AC30s and the more diminutive Matchless models and you'll find these sweet but hot sounding small bottle tubes. This issue, Derek Rocco of Watford Valves shares his tests of EL84 and 6V6GT varieties – with a little help from some Brit-rock royalty...

Many guitarists are turning on to the fact that heavenly sonics are more easily achieved for recording and small gigs by cranking up a great 15 or 20 watt amp than by piling mattresses against the doors, swaddling the walls in carpet liner, and trying to coax that 100W Marshall Plexi or Fender Twin Reverb into its tone zone while homicidal neighbours and the noise police launch tear-gas into your studio flat. Because they mimic the tonalities of their respective older brothers but do so at significantly lower output levels, these smaller valves are responsible for some of the finest tones available without risking shattering your eardrums and your tenant's agreement in the swipe of a single power chord.

Related in constructional and sonic characteristics to the larger 6L6 types, the 6V6GT is the classic small-bottle American tube. Putting out from around 6 to 15 watts each (depending on the circuit and transformers) compared to its bigger brother's 15 to 30 watt output, it endows Fender classics like the Champ, Princeton and Deluxe with an easy, smooth distortion and raw, rich texture – but make no mistake: while a 6V6 will fit a 6L6 socket, *do not* substitute them in an amp not designed to do so. The consequences could be very expensive.

Sonically aligned to the larger EL34 though different in construction – most

notably housed in a slim, baseless, 9-pin bottle – the EL84 is a true British classic. Originally found most famously in vintage Vox amps and taken up by everyone from Mesa/Boogie to Matchless to Orange to Laney in recent years, it's a sweet and sparkling output valve with easy compression and crystalline highs.

As with Pts 1 & 2, our tests will compare both current production and NOS (New Old Stock) samples; turn back to *TGM* vol 11 no 3 for a fuller explanation of terminologies and the history of Western versus Eastern European and Chinese valve production. 'GP' stands for 'guide price' and indicates the approximate price range you can expect to pay for a single valve on the UK market (remember: most amps will require either two or four output valves).

TESTING: EL84

To evaluate a range of EL84s, myself, Queen guitarist Brian May and Brian's personal tech Greg Fryer loaded the valves into a variety of Vox amps for two separate rounds of testing, under both normal playing conditions and the hardest of professional working situations. All valves were pre-selected to have the same plate current and transconductance. GE and Mullard EL84s were used as a reference.

Test 1: The amplifiers used were an original Vox AC10 Twin fitted with Elac

speakers and an original Vox AC4: for test guitars used we chose a 1973 Fender Stratocaster and a 1980 Yamaha SA2000S semi-acoustic.

Test 2: The second tests were carried out by Greg Fryer and Brian May at Brian's home in the summer of 1998 and in rehearsals in preparation for his 1998 world tour. The Vox AC30s were fitted with Celestion Greenback, Vintage 30 and Alnico Blue speakers – and Brian's famed treble boost was employed, too). This work led to the development of our Full Drive test rig, with assistance from *TGM* amp expert and Vox guru David Petersen.

MULLARD

(GB, NOS. Guide Price: £20 – £40)

The Mullard excelled in the initial test and in the tests with Greg and Brian. They provided crisp, ringing sustain and huge tight bottom end with clarity which sounded larger than life, giving the impression of space and immense detail. It never seemed to lose control even when Brian's treble boost was added; indeed, it seemed to get more punchy and dynamic. Bass, middle and treble were all in proportion. We all agreed this is a great valve – and impressive in standing up to the massive punishment it receives inside Brian's flat-out AC30s.

EUROPEAN 'STR'

(European, NOS. GP: £10 – £15)

This valve has always, in my opinion, got as close to the Mullard as you could go without buying a Mullard. It's got rich, creamy mids with a GE-style sound stage, and the bottom end is tighter and deeper than the Sovteks. Under normal saturated conditions this valve always sounds in control, with sweet, clear treble. Greg and Brian liked these valves for the aggressive edge and musical tone under treble-boosted conditions.

SOVTEK

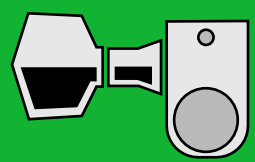
(Russia, current. GP: £4 – £8)

This current production valve is used by many leading OEM including Laney and Peavey. Generally we find it has around half the anode current of a Mullard, and the gain is also a lot lower, but soundwise it's better and more reliable than the Chinese valves – though it doesn't have a great deal of bass, and when pushed hard it tends to go muddy. In a regularly gigged amp we suggest you buy two or three sets, as they'll wear out. Great for repairers and hobbyists, though.

SOVTEK EL84M

(Russia, current. GP: £5 – £10)

The EL84M is a Russian military surplus which is of more robust construction than the standard item, with current draw typical of what we would expect for a military valve. In the amps this valve sounded fine with good balance, and the midrange was more detailed than its



cheaper relation. With normal drive units the valve sounded aggressive with deep bass; with Brian's treble boost the midrange sound became very heavily compressed. To my ear this sounded awful with the Greenbacks, got better with the Vintage 30s and sounded very aggressive with the Blue speakers.

Not the refinement of the Mullard or Philips, then, but it does push the solo right out which recessed the bass and top under heavy distortion, and it has a unique mid-range honk that Greg and Brian both love. Recommended.

GE 6BQ5

(USA, NOS. GP: £18 – £24)

Many American-made units will carry a '6BQ5' designation, the US code number for EL84 valves – but they're exactly the same thing. The GE valves have always been a favourite of mine and in the Vox amps they showed all the virtues: gain, balance and huge sound.

With the treble boost in place the middle thickened up – it sounded heavy and crisp without losing definition. With Brian playing the famous Queen runs the valve was extremely touch-sensitive. This is a great valve and sounded superb in the Vox AC30.

PHILIPS ECG

(USA, NOS. GP: £15 – £24)

In my own tests this was my favourite EL84. The valve has plenty of bottom end, sweet clean midrange, and a top end that's brighter than the Mullard. When pushed with a Real Tube Driver, Ibanez Tube Screamer or standard distortion unit the valve has quality and refinement, providing cutting solos just on the edge of mayhem.

The treble response is sweet and clear with plenty of definition, but when Greg introduced Brian's treble boost the valve did appear to go over the edge somewhat (the change happened in the midrange response, which seemed to go wild: remember, though, that the treble boost adds huge gain at line level and is selected for certain frequencies, and this shouldn't prove a problem for other musicians in any set up). Here we are dealing with the classic trademark sound of a genuine guitar hero, and for his applications the Mullard, which excelled in this area, got the vote (and Brian can afford 'em). This is a great valve in all applications.

JJ/TESLA

(Slovak Rep., current. GP: £6 – £12)

This valve was not part of the test with Greg and Brian, but its sound quality is great: a cross between the bright sweet sound of the Philips with the balls of the Mullard. It's not as high gain as the STR

and therefore gives a little more headroom, plus a nice rich overdrive sound with clear top end response. The balanced presentation makes this an ideal choice.

EL84 TEST RESULTS

Cue the familiar conclusion: all three of us agreed that the **Mullard** is the best overall valve, although the **GE** also scores very well due to its big sonic spectrum. These two valves can both be considered a true reference of the type. On the other hand, they are very pricey and you might find it hard to justify the expense... without your record company or someone else picking up the tab! Greg and Brian both liked the **European STR** which in the test we called **NOS European** (though branded by Watford Valves as the Harna STR) as we aren't 100 per cent sure of its origin. This is the closest in terms of tone to the Mullard and also the closest in terms of specification. .

The **Philips EL84** is the best sounding in the Vox as its rich, bright sound gives the amp a cleaner edge. When the treble boost is applied the valve goes into mega distortion – which I love – but the valve does not have the control of the Mullard. Of the current production items the **JJ/Tesla** sounds brighter and cleaner in normal operation than the **Sovteks**. Both of these valves show good bass and treble response under normal distorted situations, but in treble boost mode the Sovtek EL84M seems to handle the punishment a little better. They do sound muddy in comparison to the Mullards but they never lose control, and they seem better balanced than the JJ, which seems to go very middly.

Overall, there are many good sounding, reliable EL84s on the market which can suit all budgets and playing situations.

TESTING: 6V6GT

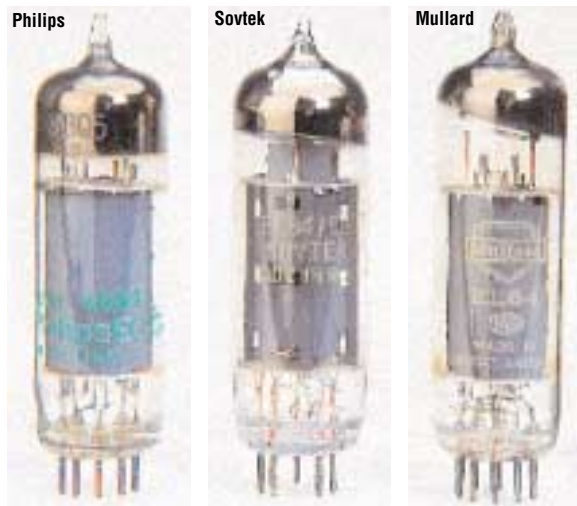
The 6V6GT is one of my favourite valves, but so many modern amps that use it do not have the tone of those classic tweed Fender Deluxes – one of the greatest rock'n'roll amps of all time. We set out to find out why.

The amplifier used was a Fender Princeton Reverb II Paul Rivera model – a good amp to evaluate 6V6, being capable of supplying some very crunchy modern sounds as well as vintage. To the 1973 Fender Stratocaster and Yamaha SA2000S we added a 1980 Gibson Les Paul Standard.

RCA 6V6GT/A

(USA, NOS. GP: £18 – £25)

These were used as the reference and seem at home with single coils or humbuckers. They produce a fat, controlled bass with a strong mid character. The valve has great balance and individual notes can



be easily distinguished even under heavy distortion – every slight variation of tone is accurately reproduced. When pushed hard the midrange character distorts beautifully, with clarity and refinement. Valves from the '50s and '60s which are the most sought after. This is a hard valve to beat.

MAZDA

(France, NOS. GP: £10 – £14)

These are a 1950's French military valve that we decided to test at 500V DC plate and screen on our test rig (well above their rated maximums). Five hours later they were rock-solid where others had died – a serious indication of the unit's solidity.

Fitted into the Princeton the Mazda rocks, the sonic spectrum big, the distortion fat and punchy. The bass response is not as deep as the RCA, mind, and it does sound slightly edgy. When overdriven the valve has a raw, organic sound which I fell in love with; it seems better suited to the grungy side of rock. With a Les Paul the sustain is full and rich with no harsh edges – you feel you're playing a wall of amps, not just a little Princeton. These babies are great little blues valves and work well with the semi-acoustic Yamaha in both single and humbucking mode. The valve doesn't lose punch or go muddy even when effects are introduced. We loved them.

SOVTEK

(Russia, current. GP: £5 – £10)

Sovtek have some good valves in their line up, but sadly this is not one of them. It has trouble in old Fender Deluxes as it cannot handle plate voltages of much above 345V DC (indeed in tests many died at 325V DC, so be warned). The valve is very harsh-sounding with an inferior bass response, and when overdriven it is very muddy. A good measure of a valve is, 'do your ears hurt after prolonged use?' Boy, with this valve I was hurting.

STANDARD 6V6GT

(USA, NOS. GP: £16 – £24)

With its brown base and semi-smoked glass this looks identical to the RCA units (and was possibly made by them). The top end of this valve really sings; the more you throw at it, the more it wants. Killer Kossoff-like sustain is achievable with the amp really pushed, with no harshness. The bass is bigger than the Mazda and keeps full definition even on fast runs. Balance is superb – clear and precise – and the valve is at home with country or jazz. Thoroughly recommended.



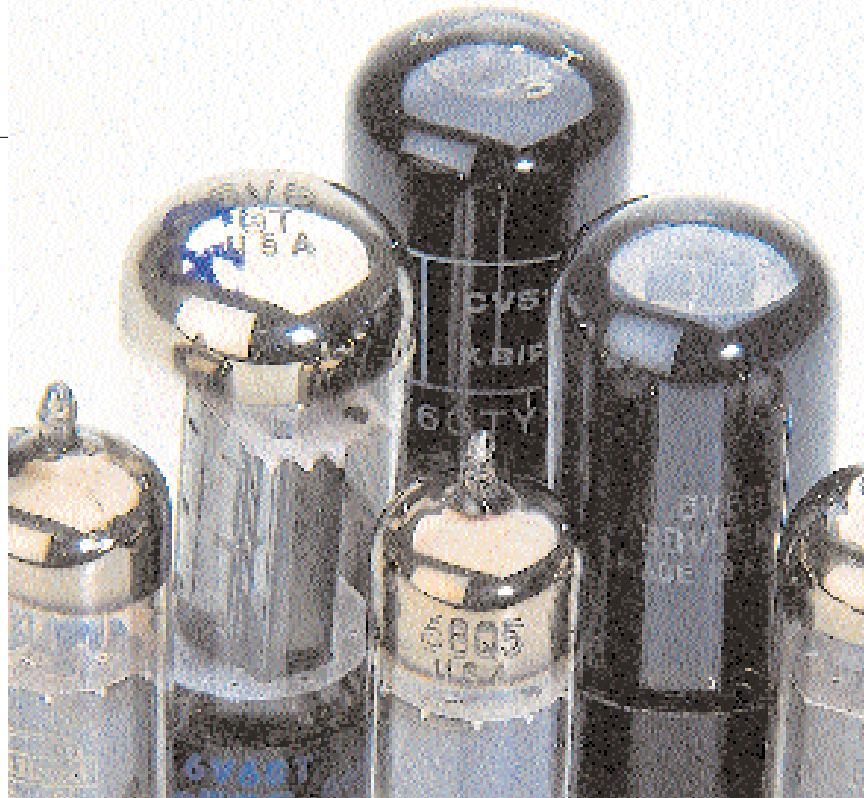
Brimar 6V6GT/CV511



Sovtek 6V6GT



Philips 6V6GT



PHILIPS

(USA, NOS. GP: £10 – £18)

This is identical to the valves used by Fender in the '70s and would have been the standard valve fitted to the Princeton when new. It's a lot brighter than the Mazda or Standard and works very well with the Fender Strat. The amp sounds thinner, however, due to the sonic presentation being not as large, and the sustain isn't as fat or as long-lasting as the Mazda or Standard. The bass is not as well-defined, either, but the tone is still rich and warm. A great rock'n'roll valve.

GE (LARGE & 'NUDE' BASE)

(USA, NOS. GP: £12 – £18)

Watford Valves currently stock two types of GE: one with the pins straight out the bottom like the Sovtek 5881 and one with a full base. Both valves have the large grey box plate, and we found the sound quality to be identical when both are placed together.

These have the characteristic GE sonic presentation: big, fat and proud. The top end response is noticeably less than the

Philips, with midrange twang more pronounced than any other. It's a forward, in-your-face tube with great punch. Ideally suited to country or steel guitar.

ELECTRO-HARMONIX 6V6EH

(Russia, current. GP: £5 – £10)

A newer offering, this is a Russian unit commissioned by Electro-Harmonix to duplicate the design of the RCA (also sold as the Hama 6V6GT 'STR') – and it holds its own surprisingly well against the classic RCA. Compared to the bright, well-balanced Philips the 6V6EH also performs well, with a nice top end sparkle which is not quite as bright but still great for that out-of-phase Strat sound. When pushed hard it maintains control, sounding loud and clear. When fully saturated the EH is not as crisp and round in the midrange, but starts to blur – actually a great sound.

The EH doesn't have quite the huge sonic presentation of the Mazda nor its refinement – and it breaks up somewhat earlier – but this gives it a unique voice which will undoubtedly appeal to a lot of people. The sustain is lovely and singing sustain, the breakup rich with plenty of bottom end slam, balancing performance with fine detail; what's more our tests so far prove it's sturdy and well built. A great addition to the market.

WESTINGHOUSE 6V6GTA

(USA, NOS. GP: £12 – £20)

These valves are marked 'USA' and come in the original box. These are for the Neil Young fans with fantastic bass response due to the bass-forwardness of the valve's sonic presentation. When distorted the bottom notes on the guitar are in full focus –

MUST YOU SPEND A FORTUNE?

great for riffing or heavy Zep-style music. The top end is not as detailed, but sustain is good and clear; the midrange seems a little recessed but Strat twang can still be produced. This is definitely for hard rockers.

SYLVANIA 6V6GT/A

(USA, NOS. GP: £10 – £16)

This is a very warm-sounding valve that's a little bass-light when compared to the Standard or Mazda. The midrange response is this valve's real voice, and the clarity and Fender twang shine through. Sustain is warm and rich, if again not as forward as the Mazda. When pushed hard the bass seems to become less defined but the valve still retains a very musical sound.

BRIMAR 6V6GT/CV511

(GB, NOS. GP: £7 – £16)

We have recently seen a lot of dealers trying to make a market in these by saying that they are a super hi-fi valve and great guitar valve, with high prices to match. If you want a hi-fi valve, the Mazda stamps all over this.

In guitar amps the Brimar is a traditionally British-sounding unit. The bass response is lighter than the RCA, Mazda or Westinghouse and it has a very smooth, laid-back sound with no harshness. It doesn't have the 'get up and go' of most of the other valves tested, which is a shame, though the clear midrange never gets flustered, even with heavy rock. Rock solid stability and a good all round valve – ideally suited, maybe, to jazzers.

VISSEAUX

(France, NOS. GP: £10 – £16)

This is another French military valve with a lot of the same characteristics of the Mazda. It has rich sustain with good bass – not as deep as the RCA, Standard or Westinghouse, but about the same as the Mazda. Like the Brimar, the mids are very smooth and controlled without the Mazda's raw edge. The top end response seems recessed compared to the Philips or Mazda, but there's still plenty of traditional Fender twang on tap and sustain superb, rich and clear. This valve is very well balanced and would be a good choice for all applications.

6V6GT TEST RESULTS

The first rule when fitting 6V6GTs is to avoid the Russian 6p3s valve which an American designer valve company re-brands as their own 6V6HD. In our experience this version is a poor unit which is also very hard to bias. This valve is also sold by many UK dealers under the guise of 6L6GC, 6L6GT and 6L6GB. We do not recommend fitting any of these. The more commonly seen **Sovtek 6V6GT** reviewed above is poor in the sound quality department, so the best alternative

These tests were conducted with the specific aim of determining the fine points of valve characteristics and performance with the central goal of telling you which will be the best-sounding and longest-lasting components for a variety of tastes and applications. Over the course of these three articles it might have looked liked our reviews have been splitting hairs over certain matters – comparing ultra fine-tuned sonic nuances which might be virtually undetectable to many players – but as with everything we do at TGM, if a product is worth testing, it's worth testing thoroughly.

The difficulty that 'open field' reviews presents us, however, is that very often the more expensive items prove the superior. That's been no different through the course of these *Tube Tasting* features, where nine times out of ten (though by no means always) we found you get what you pay for. That leaves us in the awkward position of appearing to suggest that in order to achieve any half-decent tone you need to re-mortgage the house to invest in a quartet of Mullards or RCAs. Not so. If your budget is limited, it won't always be advisable to spend large sums on valves which, by nature, will eventually burn out – however good they are. (Think of them like fine wine: as soon as you start enjoying them, they're on a countdown to extinction. Then again, what's the fun of

leaving them racked up in the cellar? What a dilemma...)

Other more affordable types might be perfectly suitable to your needs, so don't feel you must have the most expensive options to be happy with your amp. Comprehensive testing available today can weed duff budget units from good, and many affordable current production valves from Sovtek, JJ Tesla and Electro-Harmonix among others can sound extremely good indeed. If you're gigging your Vox AC30 three or four times per week plus rehearsals with no big record deal to foot the bills, it's probably not worth risking burning up £160-worth of Mullard EL84s or £80-worth of Philips ECGs on a pub full of sweaty punters who won't notice the difference five pints into the set; but £40-worth of JJ/Teslas might sound righteously rocking, and end up lasting you two years anyway (and if you want to treat yourself to the Mullards, maybe tuck them away for recording and special occasions). In short, these things will blow up eventually, however good they are, so don't spend beyond your means just for the sake of it.

Finally, thanks again to Derek Rocco and the others from Watford Valves and beyond who contributed to *Tube Tasting*, without whom these features would not have been possible.

Dave Hunter

by far for current production 6V6s is the Russian-made **Electro-Harmonix 6V6EH**, a laudable copy of the classic RCA. The 6V6EH is one of the best valves of its type to be produced since the 1960's: it provides balanced performance with fine detail and offers credible performance both in clean and distorted modes. This valve is important as it provides a current-manufacture 6V6GT that can be fully recommended, and gives the OEMs the chance to produce a great-sounding rock and blues amp that could put tone back at your fingertips – so let's see them do it!

Taking in the entire field, however, the **RCA** is still the valve to beat, but two others come very close: the **Mazda 6V6GT** and the **Standard 6V6GT**, and the former is not badly priced by any means either. The Mazda really rocks from Zep to Muddy Waters. It has a raw, wild

feel and makes you want to play the guitar and feel good – and it makes it easy to get a great sound quickly. The Standard 6V6GT does everything that the Mazda but with more control; push it harder and harder and it simply shouts back, 'Give me more!' Its huge bottom end response is clear as a bell. These are 1958 production and are identical to the RCA that we used as a reference. Under heavy distortion the valve just seems to get bigger, with a sustain that is simply remarkable.

The new Electro-Harmonix valve aside, this market remains dominated by NOS units, but fortunately these out-of-production examples are generally less costly than NOS 6L6s or EL34s, with the Mazda, Brimar, Philips and even GE within reach of most players. Try a few sets before they are all gone.

